

CLAIMS

1. A lithographic printing plate comprising:
a substrate; and
a single-coat self-organized multilayer infra-red imageable material.

5 2. A lithographic printing plate according to claim 1, said plate suitable for printing without fount (waterless).

3. A lithographic printing plate according to claim 1, said plate suitable for printing with fount.

10 4. A lithographic printing plate according to claim 1, wherein the substrate is aluminum.

5. A lithographic printing plate according to claim 4, wherein the aluminum is grained and anodized.

6. A lithographic printing plate according to claim 4, wherein the aluminum is treated with phosphoric acid.

15 7. The lithographic printing plate of claims 4, 5 and 6, wherein the aluminum is pre-coated with a thermally insulating organic coating.

8. A lithographic printing plate according to claim 1, wherein the substrate is polyester.

20 9. The lithographic printing plate of claim 1, wherein the single coat self-organized multilayer contains a poly dimethyl siloxane.

10. The lithographic printing plate of claim 9, wherein the poly dimethyl siloxane has been polymerized by addition.

25 11. The lithographic printing plate of claim 9, wherein the poly dimethyl siloxane has been polymerized by the presence of catalysts and cross-linkers.

12. The lithographic printing plate according to claim 1, wherein the single-coat self-organizing material contains a hydrophilic polymer.

13. The lithographic printing plate of claim 1, wherein the single coat self-organized multilayer contains an infrared absorbing dye or mixture of dyes.

5 14. A lithographic printing plate of claim 13, wherein said single-coat self-organized multilayer infra-red imageable material comprises silicone polymers and non-silicone polymers.

15. The lithographic printing plate of claim 14, wherein the single coat self-organized multilayer contains an infrared absorbing dye or mixture of dyes.

10 16. The lithographic printing plate of claim 15, wherein the non-silicone polymer is instrumental in incorporating the dye or dyes into the multilayer coating.

17. The lithographic printing plate of claim 14, wherein the non-silicone polymer is nitrocellulose or a mixture of nitrocelluloses.

15 18. The lithographic printing plate of claim 14, where the non-silicone polymer is hydrophilic.

19. The lithographic printing plate of claim 14, where the non-silicone polymer is oleophilic.

20 20. The lithographic printing plate of claim 14, wherein the non-silicone polymer decomposes exothermically during ablation imaging.

21. The lithographic printing plate of claim 14, wherein the non-silicone polymer provides strong adhesion to the substrate.

22. The lithographic printing plate of claim 14, which on selective imaging by infra-red ablation gives oleophilic image areas formed by the surface of

the substrate, and oleophobic non-image areas formed from unablated silicone.

23. The lithographic printing plate of claim 14, which on selective imaging by infra-red ablation gives oleophilic image areas formed by the non-

5 silicone polymer- enriched surface directly attached to the substrate exposed by the image ablation process and oleophobic non-imaged areas formed from unablated silicone.

24. The lithographic printing plate of claim 14, which on selective ablation by infra-red radiation gives hydrophilic ablated (background) areas formed

10 by the surface of the substrate, and oleophilic non-ablated (image) areas formed from unablated silicone.

25. The lithographic printing plate of claim 14, which on selective ablation by infra-red radiation gives hydrophilic ablated (background) areas formed by the non-silicone polymer- enriched surface directly attached to the

15 substrate exposed by the ablation process and oleophilic non-ablated (image) areas formed from unablated silicone.

26. A method of forming a lithographic printing plate, comprising the steps of:

providing a substrate; and

20 applying a single-coat self-organizing infra-red imageable material onto said substrate.

27. The method of claim 26, wherein the substrate is aluminum.

28. The method of claim 27, wherein the aluminum is grained and anodized.

29. The method of claim 27, additionally comprising the step of treating the aluminum with phosphoric acid.

30. The method of claims 27, 28 and 29, additionally comprising the step of pre-coating the aluminum with a thermally insulating organic coating.

5 31. The method of claim 26, wherein the substrate is polyester.

32. The method of claim 26, wherein the single coat self-organizing contains a poly dimethyl siloxane.

33. The method of claim 32, additionally comprising the step of polymerizing the poly dimethyl siloxane by addition.

10 34. The method of claim 32, additionally comprising the step of polymerizing the poly dimethyl siloxane by the presence of catalysts and cross-linkers.

35. The method of claim 26, wherein the single-coat self-organizing material contains a hydrophilic polymer.

15 36. The method of claim 26, wherein the single coat self-organizing material contains an infrared absorbing dye or mixture of dyes.

37. The method of claim 26, wherein said single-coat self-organizing infrared imageable material comprises silicone polymers and non-silicone polymers.

20 38. The method of claim 37, wherein the single coat self-organizing material contains an infrared absorbing dye or mixture of dyes.

39. The method of claim 38, wherein the non-silicone polymer is instrumental in incorporating the dye or dyes into the single coat.

25 40. The method of claim 37, wherein the non-silicone polymer is nitrocellulose or a mixture of nitrocelluloses.

41. The method of claim 37, where the non-silicone polymer is hydrophilic.

42. The method of claim 37, where the non-silicone polymer is oleophilic.

43. The method of claim 37, wherein the non-silicone polymer decomposes exothermically during ablation imaging.

5 44. The method of claim 37, wherein the non-silicone polymer provides strong adhesion to the substrate.

45. The method of claim 26, wherein the self-organizing infra-red material is deposited from a mixture of at least two volatile organic solvents.

46. The method of claim 45, wherein said single coat self-organizing
10 material additionally contains a poly dimethyl siloxane, said poly dimethyl siloxane soluble in at least one of said mixture solvents.

47. The method of claim 37, wherein the self-organizing infra-red material is deposited from a mixture of at least two volatile organic solvents.

48. The method of claim 47, wherein the non-silicone polymer is soluble in
15 at least one of said mixture solvents.

49. The method of claims 45 and 47, additionally comprising the step of diluting the solvent mixture in order to permit all of the ingredients to remain in solution for at least 8 hours.

50. The method of claims 36 and 38, wherein the single coat self-
20 organizing material contains a poly dimethyl siloxane and wherein the infra-red absorbing dye or dyes are chosen so that they do not inhibit the curing of the poly dimethyl siloxane.

51. The method of claim 26, additionally comprising the step of heating said applied self-organizing infra-red imageable material, wherein the
25 material organizes itself into an infinite number of horizontal layers

constituting a self-organized system.

52. The method of claim 37, additionally comprising the step of heating said applied self-organizing infra-red imageable material, wherein the material organizes itself into an infinite number of horizontal layers

5 constituting a self-organized system having a mixture rich in poly methyl siloxane on its surface and a mixture rich in non-silicone polymer in proximity to the substrate surface.